**Testing Plan**

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| **Test Name** | **Pre conditions that have to be in place before running this test.** | **Input to drive the test** | **Expected outcome** |
| ‘X’ goes first | X’s and O’s have been assigned to players. If the computer is X, the user must not have made a selection yet. | Either the user will click on an open box or the AI will randomly choose a box to start the game | The ‘X’ character will be the first character to be placed into a square |
| ‘O’ goes after ‘X’ | The game must be in progress with X’s and O’s assigned to each player. | Either the user will click on an open box or the AI will randomly choose a box to continue playing | The ‘O’ character will be placed into the selected square after the ‘X’ character has gone |
| A square cannot be overwritten | At least one square has been selected. | The test will select every square that has already been taken | The user will not be able to click on the taken square and the user will be allowed to choose a different square |
| Detecting win | A player has obtained 3 consecutive squares in either the vertical, horizontal or diagonal. | The array representing the chosen squares will be scanned. | There will be a visual display of the win line and will display who one and how many times it took for that user to win |
| Detecting tie | The program has detected that the game has ended. | Neither the user nor the AI has won and there are no moves remaining in the game. | There will be a display that the game was a tie |
| Restart game | None | The user will have to press the restart button | The board will clear of all characters from the previous match and all instance variables in the GuiController and Squares will be reset. |
| Testing Move Suggestions | It is the user’s turn.  The game is in progress. | The user is hovering over a square. | An “intelligent” move will be displayed in gray to the user. |
| Testing User Fork Suggestions | It is the users turn. The game has started. | The user suggestion should be a fork possibility for the user. | The user will be able to create a fork for themselves and greater their chances of winning. |
| Testing User Fork Block | It is the users turn. The game has started. The AI has a possible fork they can create. | The AI would set up a possible fork. | The suggestion square will help the user prevent a fork. |
| Testing Undo Function | User either chooses a bad move or a move that they want to change. | User’s last move. | The game state should revert back to before the user’s last move. |